

What is claimed is:

1. A fuel injector, in particular an injector for fuel injection systems of internal combustion engines, having an actuator (10), which cooperates with a valve needle (34, 51, 73); a first valve closure member (35, 52), arranged on the valve needle (34, 51, 73), cooperating with a first valve seat surface (33, 53) on a valve seat body (32, 50) forming a first sealing seat (36, 54),
wherein a second valve closure member (38, 55, 75) cooperates with a second valve seat surface (40, 56) in the valve seat body (32, 50) to form a second sealing seat (41, 57), and the valve needle (34, 51, 73) or the first valve closure member (35, 52) has a limit stop, at which, after a partial stroke (h_1) of the valve needle (34, 51, 73), a counter limit stop of the second valve closure member (38, 55, 75) comes into contact and lifts the second valve closure member (38, 55, 75) in a further stroke of the valve needle (34, 51, 73) from the second sealing seat (41, 57).
2. The fuel injector as recited in Claim 1,
wherein the valve seat body (32, 50) has a first circumferential hole circle (45, 65) having a plurality of spray-discharge bore holes (44, 64), which are arranged in the valve seat body (32, 50) so that the first sealing seat (36, 54) seals the first hole circle (45, 65) with respect to a fuel supply (45a, 63).
3. The fuel injector as recited in Claim 2,
wherein a second circumferential hole circle (46) having a plurality of spray-discharge bore holes (44) is arranged so that the first sealing seat (36) and the second sealing seat (41) seal the second hole circle (46) with respect to a fuel supply (45a).
4. The fuel injector as recited in Claim 3,
wherein the valve needle (34, 73) or the first valve closure

member (35) surrounds and guides the second valve closure member (38).

5. The fuel injector as recited in Claim 4, wherein the second valve closure member (38) is guided in a bore hole (37) of the valve needle (34, 73) or of the first valve closure member (35), and is biased **[prestressed]** against the second sealing seat (41) by a spring (39), which is supported against the valve needle (34, 73) or the first valve closure member (35).

6. The fuel injector as recited in Claim 5, wherein the limit stop of the valve needle (34, 73) or of the first valve closure member (35) is a step (43) in the bore hole (37), and the counter limit stop of the second valve closure member (38) is a projecting collar (42).

7. The fuel injector as recited in Claim 2, wherein the second valve closure member (55) surrounds the valve needle (51) or the first valve closure member (52).

8. The fuel injector as recited in Claim 7, wherein the second valve closure member (55) is guided by the first valve closure member (52) and is biased **[prestressed]** against the second sealing seat (57) by a spring (58), which is supported against a spring receptacle of the fuel injector, and

a second circumferential hole circle (66) having a plurality of spray-discharge bore holes (64) is arranged so that the second sealing seat (57) seals the second hole circle (66) radially on the interior, and a third sealing seat (69), which is formed by the second valve closure member (55) having the valve seat body (50) on a third valve seat surface (68), seals the second hole circle (66) radially to the outside with respect to a further fuel supply.

9. The fuel injector as recited in Claim 8,

wherein the limit stop of the valve needle (51) or of the first valve closure member (52) is a circumferential collar (60), and the counter limit stop of the second valve closure member (55) is a groove (61) in a bore hole (62), in which the first valve closure member (52), or the valve needle (51), passes through the second valve closure member (55).

10. The fuel injector as recited in one of Claims 3 through 9, wherein the spray-discharge bore holes (44, 64) of the first hole circle (45, 65) have different spray-discharge angles with respect to the spray-discharge bore holes (44, 64) of the second hole circle (46, 66).

11. The fuel injector as recited in one of the preceding claims, wherein the first valve closure member (35, 52) and the second valve closure member (38, 55, 75) are arranged so as to be coaxial.

12. The fuel injector as recited in one of the preceding claims, wherein the valve seat body (32, 50) has a central spray-discharge bore hole (47, 67).

13. The fuel injector as recited in one of the preceding claims, wherein the valve needle (73), after one portion of its stroke, strikes against a limit stop ring (80), which is supported by a spring (81) against the valve body (72) of the fuel injector.

Abstract

A fuel injector, in particular, an injector for fuel injection systems of internal combustion engines, having an actuator, which cooperates with a valve needle (34, 51, 73), has a first valve closure member (35, 52) that is arranged on the valve needle (34, 51, 73), the valve closure member cooperating with a first valve seat surface (33, 53) on a valve body (32, 50) forming a first sealing seat (36, 54). A second valve closure member (38, 55, 75) cooperates with a second valve seat surface (40, 56) in the valve seat body (32, 50) forming a second sealing seat (41, 57). The valve needle (34, 51, 73), or the first valve closure member (35, 52), has a limit stop, against which, after a partial stroke (h_1) of the valve needle (34, 51, 73), a counter limit stop of the second valve closure member (38, 55, 75) strikes, lifting the second valve closure member (38, 55, 75) from the second sealing seat (41, 57) in response to a further stroke of the valve needle (34, 51, 73).

20 (Figure 2)